

WHAT IS CLAIMED IS:

1. A method for removing rosin flux residue from assembly surfaces, interfaces and under device surfaces which comprise the steps of:
 - (a) providing a first cleaning composition which comprises a first water insoluble hydrophobic solvent with a surface active agent;
 - (b) immersing the assembly in said first cleaning composition and soaking the assembly in said first cleaning composition for 10 to 20 minutes at 50 to 90°C with intermittent agitation;
 - (c) removing the assembly from said first cleaning composition;
 - (d) immersing the assembly in a second cleaning composition which comprises a second water insoluble hydrophobic solvent and soaking the assembly in said second cleaning composition for 5 to 20 minutes at 50 to 90°C with agitation;
 - (e) removing the assembly from said second cleaning composition;
 - (f) applying a third cleaning composition which comprises a hydrophilic water soluble propylene glycol methyl ether solvent at 50 to 75°C to the assembly for 5 to 10 minutes;
 - (g) applying a water rinse at approximately room temperature to 65°C to the assembly for approximately 5 to 10 minutes; and
 - (h) drying the assembly and thereby complete the removal of the flux residue from the assembly surfaces, interfaces and from under the device surfaces.

1 2. The method of claim 1 wherein said first water insoluble hydrophobic solvent and
2 said second water insoluble hydrophobic solvent are propylene glycol alkylethers represented
3 by the formula $RO-(C_3H_6O)_N-C_3H_6OH$ wherein R is selected from the group consisting of
4 propyl, butyl, pentyl and isobutyl and where $N = 0$ to 4.

1 3. The method of claim 1 wherein said surface active agent is an ionic surfactant.

1 4. The method of claim 1 wherein said surface active agent is a combination of ionic
2 and non-ionic surfactants.

1 5. The method of claim 4 wherein said ionic surfactant comprises approximately 60 to
2 70 weight % rosin flux and approximately 30 to 40 weight % benzyl alcohol.

1 6. The method of claim 1 wherein said second water insoluble hydrophobic solvent is
2 the same composition as said first water insoluble hydrophobic solvent.

1 7. The method of claim 1 wherein the agitation of step (d) is an immersion spray.

1 8. The method of claim 1 wherein said hydrophilic water soluble propylene glycol
2 methyl ether solvent is applied by immersion with pressure spray.

1 9. The method of claim 3 wherein said ionic surfactant is about 5 to 25 weight % of
2 said first water insoluble hydrophobic solvent.

1 10. The method of claim 4 wherein said combination of ionic and non-ionic surfactants
2 is about 5 to 25 weight % of said first water insoluble hydrophobic solvent.

1 11. The method of claim 4 wherein said non- ionic surfactant is selected from the group
2 consisting of rosin acid ester derivatives, abietyl alcohol, dihydroabietyl alcohol and mixtures
3 thereof, and wherein said ionic surfactant is selected from the group consisting of abietic acid,
4 dihydrabietic acid, tetrahydroabietic acid, dehydroabietic acid, and mixtures thereof.

1 12. The method of claim 4 wherein said non-ionic surfactant is selected from the group
2 consisting of low foam alkyl polyglycosides, ethoxylated propoxylated aliphatic alcohols, and
3 mixtures thereof.

1 13. The method of claim 1 wherein said hydrophilic water soluble propylene glycol
2 methyl ether solvent is represented by the formula $\text{CH}_3\text{O}-(\text{C}_3\text{H}_6\text{O})_N-\text{C}_3\text{H}_6\text{OH}$ where $N = 0$ to

1 14. The method of claim 3 wherein said ionic surfactant is selected from the group
2 consisting of abietic acid, dihydrabietic acid, tetrahydroabietic acid, dehydroabietic acid, and
3 mixtures thereof.

1 15. The method of claim 1 wherein the drying of step (h) comprises blowing gas on the
2 assembly and then heating the assembly to 80 to 120°C.

1 16. The method of claim 15 wherein said gas is N₂.

1 17. The method of claim 15 wherein said gas is air.

1 18. The method of claim 2 where N = 1 to 3.

2 19. The method of claim 13 where N = 1 to 3.

1 20. The method of claim 15 wherein said step of heating the assembly to 80 to 120°C is
2 performed under vacuum.